

STANDARD PHRASEOLOGY

SECTION E

1. This section of standard phraseology is for general use in mechanical disciplines.

Disassemble each \_\_\_\_, using 2.\_\_\_ for guidance.

E1a

Disassemble each \_\_\_\_ in accordance with 2.\_\_\_.

E1b

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Protect, blank, wrap, cover, or mask equipment and openings to preclude damage and prevent entry of contaminants into gas turbine engines (including FOD screen), uptake spaces, engine room, machinery, equipment, valves, vent system, and other openings prior to cleaning operation.

E2

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NOTE:        USE AS A SUBPARAGRAPH WHEN DISASSEMBLY IS INVOKED.

Measure and record sizes and clearances of each \_\_\_\_, using 2.\_\_\_ for guidance.

E4a

Measure and record sizes and clearances of each \_\_\_\_ in accordance with 2.\_\_\_.

E4b

NOTE:        USE FOR NONCRITICAL EQUIPMENT (GENERAL USE).

Include sizes and clearances for wearing parts, bearing surfaces, thrust and journal bearings, seal and packing areas, and physical conditions of parts not specified for renewal.

E4c

NOTE:        USE FOR MISSION CRITICAL EQUIPMENT, ESPECIALLY FORCED  
DRAFT BLOWERS, MAIN FEED PUMPS, MAIN PROPULSION  
TURBINES, ETC.

Include sizes, clearances, fits, and finishes for wearing parts, bearing surfaces, thrust and journal bearings, seal and packing areas, and physical conditions of parts not specified for renewal.

E4d

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NOTE:        USE E5a AS A SUBPARAGRAPH WHEN DISASSEMBLY IS INVOKED.

Inspect each part for wear and defects, using 2.\_\_\_ for guidance for accept or reject criteria.

E5a

Inspect each part for wear and defects, using 2.\_\_\_ for accept or reject criteria.

E5b

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Remove test fluid and dry the \_\_\_ interior and exterior surfaces. Allowable residual fluid: None.

E6

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Straighten each \_\_\_ to within \_\_\_ inch total indicator reading.

E7

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Straighten each shaft to within \_\_\_ inch total indicator reading.

E8

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Straighten operating levers, linkages, and eccentrics to provide freedom of operation.

E9

NOTE:        FOR REFERENCE USE DOD-STD-2182, ENGINEERING CHROMIUM PLATING (ELECTRODEPOSITED) FOR REPAIR OF SHAFTING (METRIC). FOR NDT TESTING, USE B26a-B26b.

Chrome-plate each \_\_\_\_ journal in accordance with 2.\_\_.

E10

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Machine each \_\_\_\_, using 2.\_\_ for guidance.

E11a

Machine each \_\_\_\_ in accordance with 2.\_\_.

E11b

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Machine each new undersize casing wearing ring and each new oversize impeller wearing ring to sizes specified in 2.\_\_.

E12a

NOTE:        USE E12b-E12c FOR IMPELLERS WITHOUT WEARING RINGS.

Machine each new impeller wearing ring area concentric to the impeller bore within 0.001-inch total indicator reading, removing only material required to correct out-of-round and eccentric conditions.

E12b

Machine each new undersize casing wearing ring bore concentric to casing wearing ring area to sizes specified in 2.\_\_ for the mating impeller wearing surfaces.

E12c

NOTE:        USE E12d-E12e FOR IMPELLERS WITH OVERSIZED WEARING RINGS.

Machine each new impeller wearing ring concentric to the impeller bore within 0.001 inch total indicator reading, removing only material required to correct out-of-round and eccentric conditions.

E12d

Machine each new casing wearing ring bore concentric to casing wearing ring area to sizes specified in 2.\_\_\_ for the mating impeller wearing ring surfaces.

E12e

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Machine each new impeller wearing ring, using 2.\_\_\_ for guidance.

E13a

Machine each new impeller wearing ring in accordance with 2.\_\_\_.

E13b

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Machine each new casing wearing ring, using 2.\_\_\_ for guidance.

E14a

Machine each new casing wearing ring in accordance with 2.\_\_\_.

E14b

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Fit each wearing ring to corresponding groove in upper and lower casings.

E15

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Inspect wearing ring fit. Rings shall not bind and clearance shall be in accordance with 2.\_\_\_.

E16

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Stone both faces of each thrust collar to remove high spots.

E17

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Stone each \_\_\_ journal to remove high spots.

E18

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Stone each pinion and gear tooth to remove high spots.

E19

NOTE:            WHEN E20 IS USED, E21 SHALL ALWAYS BE A SUBPARAGRAPH.  
                      SPECIFY LABYRINTH OR CARBON PACKING.

Scrape, lap, and fit metal-to-metal joints of each turbine packing box, turbine case, turbine case cover, nozzle, steam chest, steam strainer, and steam strainer cover.

E20a

Lap and fit metal-to-metal joints of each \_\_\_\_.

E20b

Hand fit and restore the contact between exposed metal-to-metal, steamtight joints.

E20c

Machine, hand fit, and restore the contact between exposed metal-to-metal, steamtight joints.

E20d

Machine, hand fit, and restore the contact between exposed metal-to-metal and gasket seating surfaces, using 2.\_\_\_\_ for guidance.

E20e

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Inspect contact using blueing transfer method. Contact shall be \_\_\_\_ percent, with a continuous band of contact \_\_\_\_ wide between inner bolting perimeter and the sealing surface pressure source.

E21a

Inspect contact using blueing transfer method. Contact shall be a minimum of \_\_\_\_ percent of total surface area, including a minimum of \_\_\_\_ percent continuous contact across the pressure sealing surfaces.

E21b

Inspect contact using blueing transfer method. Contact shall be a minimum of \_\_\_\_ percent of total surface area, including a continuous band with a minimum width of \_\_\_\_ percent of the distance from the pressure source to the inner bolting perimeter.

E21c

NOTE:        FOR PUMPS WITH IMPELLER WEARING RINGS.

Inspect each assembled pump rotating assembly for concentricity to the shaft axis. Eccentricity at each bearing shaft sleeve and wearing ring mating area shall not exceed \_\_\_\_ inch total indicator reading.

E22

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NOTE:        USE FOR MINOR REPAIRS.

Restore mating surfaces exposed by \_\_\_\_ removal. Repair by removing high spots, burrs, abrasions, and foreign matter, where removal can be accomplished by hand tools.

E23a

Remove high spots, burrs, abrasions, nicks, corrosion, gasket material, and foreign matter from exposed flanges and mating surfaces.

E23b

Remove burrs and high spots from exposed sliding surfaces, screw threads, keys, and keyways.

E23c

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Assemble each \_\_\_\_, using 2.\_\_ for guidance.

E24a

Assemble each \_\_\_\_ in accordance with 2.\_\_.

E24b

Assemble, install, align, adjust, and connect \_\_\_\_, fitting and installing new \_\_\_\_ and the following new parts in accordance with 2.\_\_:

E24c

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Measure and record final sizes and clearances, using 2.\_\_ for guidance.

E25a

Measure and record final sizes and clearances in accordance with 2.\_\_.

E25b

Adjust and set the height of each worm gear, using 2.\_\_\_ for guidance.

E26a

Adjust and set the height of each worm gear in accordance with 2.\_\_\_.

E26b

Verify mesh alignment and contact, using blueing method.

E26d

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Thrust faces shall be square with shaft axis to within \_\_\_ inch total indicator reading.

E27

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NOTE:        FOR USE OF PRE-ESTABLISHED PARTS LIST FROM A TECHNICAL MANUAL OR OTHER REFERENCE.

Remove existing and install new gaskets, o-rings, pins, keys, studs, bolts, and nuts. Material shall conform to specifications in \_\_\_ of 2.\_\_\_.

E28

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Manually rotate each shaft prior to installation of pump shaft packing. Rubbing or binding of the rotating assembly not allowed.

E30a

Rotate shaft by hand one complete revolution. Binding or rubbing of the rotating assembly is not allowed.

E30b

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NOTE:        USE E31 AS A SUBPARAGRAPH WHEN SECURING DETAILS ARE INVOKED.

Apply antiseize compound conforming to MIL-PRF-907 on high temperature fasteners.

E31

NOTE:        FOR TURBINE SEALING SURFACES.

Apply triple boiled linseed oil conforming to \_\_\_\_, with a viscosity of Z-8 or Z-9 on metal-to-metal steam joints.

E32a

Apply high temperature sealing compound conforming to MIL-S-15204, Type C, on each \_\_\_\_.

E32b

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NOTE:        FOR REDUCTION GEAR, BEARING AND COUPLING COVERS.

Apply sealant conforming to MIL-S-45180, Type 2, on the metal-to-metal joints of each \_\_\_\_.

E33

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NOTE:        FOR STEAM AND STEAM DRAINS (50-100 PSIG - 425 DEGREES FAHRENHEIT).

Remove existing and install new steam piping joint gaskets and fasteners. Gaskets shall conform to Graph Lock 3125SS/Graftech sheet gasket. Fasteners and nuts shall conform to MIL-DTL-1222, Type I, Grade 400 or 405, Class A or B, QQ-N-281, nickel-copper alloy.

E34

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NOTE:        FOR STEAM AND STEAM DRAINS 600-1500 PSIG, 1000 DEGREES FAHRENHEIT (MAXIMUM).

Remove existing and install new steam piping joint gaskets and fasteners. Gaskets shall conform to MIL-G-24716. Fasteners shall conform to MIL-DTL-1222, Grade B16, alloy steel. Nuts shall conform to MIL-DTL-1222, Type I, Grade 7.

E35

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NOTE:        FOR STEAM AND STEAM DRAINS 150-1500 PSIG, 775 DEGREES FAHRENHEIT (MAXIMUM).

Remove existing and install new steam piping joint gaskets and fasteners. Gaskets shall conform to MIL-G-24716. Fasteners shall conform to MIL-DTL-1222, Type IV, Grade B-7, alloy steel. Nuts shall conform to MIL-DTL-1222, Type I, Grade 4.

E36



NOTE:        FOR PROPULSION PLANT SATURATED FEED SYSTEM 600-2050 PSIG, 300 DEGREES FAHRENHEIT (MAXIMUM).

Remove existing and install new feedwater piping joint gaskets and fasteners. Gaskets shall conform to MIL-G-24716. Fasteners shall conform to MIL-DTL-1222, Type I, Grade 5, carbon steel. Nuts shall conform to MIL-DTL-1222, Type I, Grade 5, alloy steel.

E37

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NOTE:        FOR FRESH WATER - CHILLED WATER, FEEDWATER AND CONDENSATE 100 PSIG, 250 DEGREES FAHRENHEIT (MAXIMUM), i.e., HH-P-151, CLASS I, CLOTH INSERTED RUBBER, MIL-PRF-1149, TYPE II, CLASS I, SYNTHETIC RUBBER.

Remove existing and install new fresh water piping joint gaskets and fasteners. Gaskets shall conform to \_\_\_\_, \_\_\_\_, \_\_\_\_. Fasteners and nuts shall conform to MIL-DTL-1222, Type I, Grade 400 or 405, Class A or B, QQ-N-281, nickel-copper alloy.

E39

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NOTE:        FOR SALT WATER, INCLUDING SUCTION SEA CHEST STEAM OUT CONNECTIONS, 50-250 PSIG, 150 DEGREES FAHRENHEIT (MAXIMUM).

Remove existing and install new salt water piping joint gaskets and fasteners. Gaskets shall conform to HH-P-151, Class I, cloth inserted rubber, or MIL-PRF-1149, Type II, Class I, synthetic rubber. Fasteners and nuts shall conform to MIL-DTL-1222, Type I, Grade 400 or 405, Class A or B, QQ-N-281, nickel-copper alloy.

E40

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NOTE:        FOR SALT WATER 50-250 PSIG, 150 DEGREES FAHRENHEIT (MAXIMUM).

Remove existing and install new salt water piping joint gaskets and fasteners. Gaskets shall conform to MIL-PRF-1149, Type I, Class I, synthetic rubber. Fasteners and nuts shall conform to MIL-DTL-1222, Type I, Grade 400 or 405, Class A or B, QQ-N-281, nickel-copper alloy.

E41

NOTE:        FOR FUEL OIL 600-1200 PSIG, 775 DEGREES FAHRENHEIT (MAXIMUM).

Remove existing and install new fuel oil piping joint gaskets and fasteners. Gaskets shall conform to MIL-G-24716. Fasteners shall conform to MIL-DTL-1222, Type IV, Grade B-7, alloy steel. Nuts shall conform to MIL-DTL-1222, Grade 5.

E42

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NOTE:        FOR DIESEL FUEL OIL 200 PSIG.

Remove existing and install new fuel oil piping joint gaskets and fasteners. Gaskets shall conform to MIL-G-24716. Fasteners and nuts shall conform to MIL-DTL-1222, Grade 5, carbon steel. Fasteners shall have protective coating per MIL-DTL-83488 (aluminum coating), Type II, Class 3; or ASTM B 633 (electrodeposited zinc), Type II, Service Condition 3.

E43a

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NOTE:        FOR GAS TURBINE POWERED SHIPS FUEL OIL 200 PSIG, 150 DEGREES FAHRENHEIT (MAXIMUM).

Remove existing and install new fuel oil piping joint gaskets and fasteners. Gaskets shall conform to MIL-G-24716. Fasteners and nuts shall conform to MIL-DTL-1222, Type I, Grade 400 or 405, Class A or B, QQ-N-281, nickel-copper alloy.

E43b

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NOTE:        FOR LUBRICATING OIL 50 PSIG, 180 DEGREES FAHRENHEIT (MAXIMUM) i.e., HH-P-151, CLASS I, CLOTH INSERTED RUBBER, MIL-PRF-1149, TYPE II, CLASS I, SYNTHETIC RUBBER.

Remove existing and install new lubricating oil piping joint gaskets and fasteners. Gaskets shall conform to \_\_\_, \_\_\_, \_\_\_. Fasteners and nuts shall conform to MIL-DTL-1222, Type I, Grade 2 or Grade 5, carbon steel. Fasteners shall have protective coating per MIL-DTL-83488 (aluminum coating), Type II, Class 3; or ASTM B 633 (electrodeposited zinc), Type II, Service Condition 3.

E44

NOTE:        FOR LUBRICATING OIL 150 PSIG, 250 DEGREES FAHRENHEIT  
                  (MAXIMUM).

Remove existing and install new lubricating oil piping joint gaskets and fasteners. Gaskets shall conform to MIL-G-24716. Fasteners and nuts shall conform to MIL-DTL-1222, Type I, Grade 5, carbon steel. Fasteners shall have protective coating per MIL-DTL-83488 (aluminum coating), Type II, Class 3; or ASTM B 633 (electrodeposited zinc), Type II, Service Condition 3.

E45

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NOTE:        FOR INSTALLATION OF NEW HOLD-DOWN BOLTING FOR MACHINERY  
                  WHERE SELF-LOCKING NUTS ARE NOT REQUIRED.

Remove existing and install new hold-down bolts and nuts conforming to MIL-DTL-1222, Type III, Grade 5, alloy steel. Fasteners shall have protective coating per MIL-DTL-83488 (aluminum coating), Type II, Class 2, or ASTM B 633 (electrodeposited zinc), Type II, Service Condition 3.

E46

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NOTE:        FOR INSTALLATION OF NEW HOLD-DOWN BOLTING FOR MACHINERY  
                  WHERE SELF-LOCKING NUTS ARE REQUIRED. IDENTIFY TYPE OF  
                  MATERIAL FOR SELF-LOCKING NUTS.

Remove existing and install new hold-down bolts conforming to MIL-DTL-1222, Type III, Grade 5, and self-locking nuts conforming to NASM-25027, \_\_\_\_\_. Fasteners shall have protective coating per MIL-DTL-83488 (aluminum coating), Type II, Class 2, or ASTM B 633 (electrodeposited zinc), Type II, Service Condition 3.

E47

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Install new aluminized cloth spray shields on \_\_\_\_ piping and valve flanges and components in accordance with ASTM F 1138.

E48

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Fill each \_\_\_\_ to the full mark with new \_\_\_\_ conforming to \_\_\_\_.

E49

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Allowable leakage at new and disturbed joints: None.

E50

NOTE:        NICKEL COPPER ALUMINUM (K-MONEL) BOLTING OF SEA VALVES AND PIPE JOINTS - SHALL BE USED ON INBOARD AND OUTBOARD FLANGES AND BONNET JOINTS WHERE INTEGRITY OF THE HULL AGAINST THE SEA IS CONCERNED; ALSO WHERE VALVES ARE NOT READILY ACCESSIBLE FOR INSPECTION OR MAINTENANCE, i.e., MIL-DTL-24696, COMPRESSED ASBESTOS, MIL-G-24716, GASKET, METALLIC-FLEXIBLE GRAPHITE, SPIRAL WOUND OR ASME B16.20.

SELF-LOCKING NUTS SHALL NOT BE USED ON BOILER BLOWDOWN AND DISCHARGE PIPING.

Remove existing and install new gaskets and fasteners. Gaskets shall conform to \_\_\_, \_\_\_, \_\_\_. Fasteners shall conform to MIL-DTL-1222, Type I, Grade 500 nickel copper aluminum alloy.

E51

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NOTE:        INVOKE APPLICABLE 009-12 REQUIREMENTS.

Weld build-up the cracked, worn, and eroded areas of each \_\_\_ and machine to original dimensions and contours in accordance with 2.\_\_\_.

E52a

Weld build-up the cracked, worn, and eroded areas of each \_\_\_ and machine to original dimensions and contours, using 2.\_\_\_ for guidance.

E52b

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Handwork and skim cut machined, sealing, aligning, mating, and gasket surfaces.

E53

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NOTE:        SPECIFY TYPE OF MATERIAL AND MIL-SPEC.

Install and fit new chocks and shims conforming to \_\_\_ to accomplish alignment.

E55a

NOTE:        FOR PUMPS AND TURBINES, SHIMS SHALL CONFORM TO SAE-AMS-QQ-S-763, CRES, GRADE 304.

Install and fit new shims conforming to \_\_\_ to accomplish alignment.

E55b

Drill and ream equipment support feet and foundations. Fit and install new tapered dowels.

E56a

NOTE:        SPECIFY TYPE OF MATERIAL.

Drill and ream equipment support feet and foundations. Fit and install new \_\_\_\_ tapered dowels in each unit to retain unit alignment.

E56b

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NOTE:        TO MINIMIZE THE POSSIBILITY OF STRAINER BAG RUPTURE, THE USE OF NYLON VICE MUSLIN FILTER BAGS (BECAUSE OF THEIR GREATER STRENGTH) IS RECOMMENDED.

Install new nylon filter bags in each strainer. Filter bags shall be of continuous filament nylon cloth, scoured finish, 80 by 80 thread, 75 to 100 micron fiber thickness, 125 to 200 micron holes in cloth.

E59a

NOTE:        FOR USE IN LUBE OIL SYSTEMS WHERE RUPTURE OF FILTER BAG IS NOT PROBABLE.

Install new cotton muslin filter bags with material conforming to CCC-C-432, Type 7, Class One, in each strainer.

E59b

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Chase and tap exposed threaded areas.

E62

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Install new coupling assembly and keys on each \_\_\_\_.

E64a

Bore each coupling hub concentric and to size of shaft diameter within 0.001 inch total indicator reading and perpendicular to the face within 0.001 inch.

E64b

Cut keyways in each new coupling and fit new keys to the mating shafts and coupling hubs.

E64c

Align each coupling concentric to within \_\_\_\_ inch total indicator reading and parallel to within \_\_\_\_ inch gaged at the major diameter of the coupling face.

E64d

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Inspect each bearing stave prior to installation aboard ship by probing with a pen knife or similar device at the rubber-metal interface around the total periphery of the stave to locate any unbonding of rubber from metal. A total cumulative length of unbonding greater than one inch, or any unbonding of any length allowing the knife blade to be inserted deeper than one-fourth inch, shall be cause for rejecting the stave.

E65

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Measure crankshaft deflection in accordance with 2.\_\_\_\_.

E66

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Machine each brake drum a minimum amount to remove scoring, pitting, and eccentricity. Each drum shall be concentric to the drum bore within \_\_\_\_ inch total indicator reading.

E67

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Clean each sump free of foreign material.

E68

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Hone each \_\_\_\_ to remove glazing, scoring, and ridging.

E69

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NOTE:            USE THE FOLLOWING WHEN CLEANING STEAM TURBINE  
                      INTERNALS, i.e., ROTORS, BLADING, CASING INTERNAL  
                      SURFACES.

Blast clean each \_\_\_\_ with non-erosive cleaning agent.

E72a

Cleaning agent shall be aluminum oxide with a particle size no coarser than 220 grit. Other cleaning agents such as glass beads, ash, and walnut shells are acceptable provided that the resultant finish is equivalent to that provided by 220 grit or finer aluminum oxide. The use of sand is prohibited.

E72b

Protect each machined surface against the action of the cleaning agent.

E72c

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Measure runout of each \_\_\_\_ shaft using dial indicator.

E73

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Assemble each pump rotating assembly, using 2.\_\_\_\_ for guidance.

E74

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Clear each gage line and fitting free of foreign matter and obstructions.

E75

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NOTE:        FOR USE WITH A13 AND F40 WHEN LOA/PEB RELATED.

Calibration shall be accomplished within \_\_\_\_ days preceding the scheduled LOA lock-out date.

E77

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Install new hold-down bolts and nuts conforming to MIL-DTL-1222, Type \_\_\_\_, Grade \_\_\_\_, and steel self-locking hexagon nuts conforming to NASM-25027.

E78

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E79a-E79d   Phrases deleted.   Invoke SI 009-115 for Rebabbitting.

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Polish each \_\_\_\_ to a \_\_\_\_ root mean square average for roughness.

E82

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Align each motor and compressor pulley to within \_\_\_\_ inch parallel alignment. Belts shall depress \_\_\_\_ inch at a point midway between the pulleys.

E83

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Inert system with a positive pressure of 2 PSIG, using dry, oil-free nitrogen and a nitrogen regulator.

E84a

Install relief valve downstream of nitrogen regulator and set at 5 PSIG.

E84b

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NOTE:        SPECIFY TYPE OF MATERIAL.

Drill and ream equipment support feet and foundations. Fit and install new \_\_\_ tapered dowels in each unit. The dowels shall be located in accessible locations for ease of removal that will retain unit alignment.

E86

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Clear and clean pockets and passages free of obstructions and foreign matter.

E87

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Test each remote valve operator assembly for ease of operation and proper alignment by opening and closing each valve from its remote operating station through 3 complete cycles. Allowable binding: None.

E88

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NOTE:        FOR USE ON NON-PRESSURE BOUNDARY APPLICATIONS SUCH AS  
COUPLING TAPER FITS, SPOTTING IN FOUNDATION LINERS, OR  
OTHER GENERAL APPLICATIONS WHERE BLUE CHECK IS  
APPROPRIATE.

Inspect contact between \_\_\_ and \_\_\_ using the blueing transfer method. Contact shall be a minimum of \_\_\_ percent, evenly distributed over the contact surfaces.

E89